Full-size FREE Plan feature *by Adrian Britton*

Percival Mew Gull G-AEXF

A 37 in. (940 mm) span 1/8th scale R/C model of the famous late 1930s racing aircraft for 400 size electric power, designed and presented by Adrian Britton

Having designed this model as a free-flight scale kit for *Aerographics* some time back, I kind of fancied the project as a larger R/C electric version for myself. Now I can still walk downwind and down hill if I must, but getting back to base with a recovered model is definitely nostalgia forever! More recently, the pleasure of humping fuel and battery laden flight boxes around has also been forsaken. In fact, if it wasn't for the incredible advances in electric power systems, I think I'd have taken up boats or railways!

So I scratched this one up a couple of years ago and it's well outlasted some of my other models. There should still be a build thread about it on *RCGroups.com* 'Scale Electric' forum. Just click on my name (if you can find it!) and look up *'threads started by'* (Maybe there should also be one entitled *'models never finished by'* in my case!)

This model feature is accompanied by a full feature on the full-size Mew Gull aircraft. So, aside from wishing this to be my tribute to the memory of one of the world's greatest aviators, the recently late *Alex Henshaw, I'll just get on with the model part.

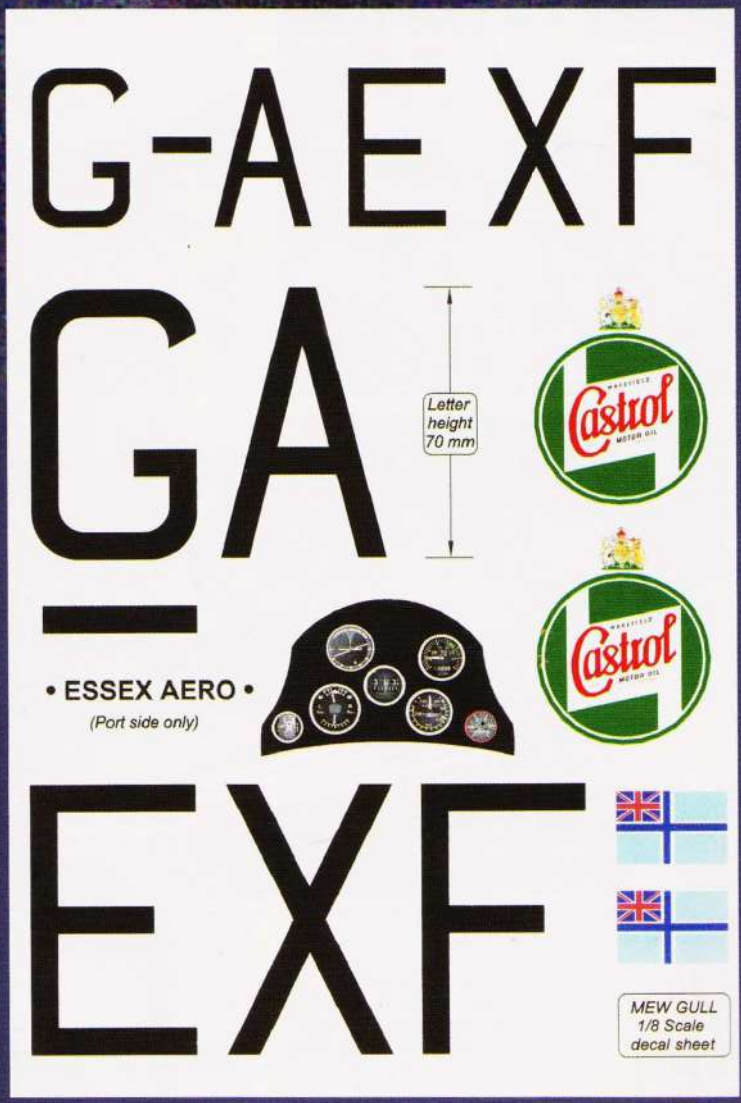
Firstly, this is not a beginner's build. Although I have prepared files for most of the main wood items for a CNC parts kit, there will still need to be some skill and initiative applied to construct a suc-

cessful scale model. Whilst I have taken advantage of these methods to conveniently interlock things here and there, I have also tried to ensure that this is not done so much as to make it too difficult for the model to be built from the plan and its patterns alone. (My original prototype was simply scratch-built, however. It is also still powered with the brushed '400' geared unit). Not many flights this year though!

Fuselage

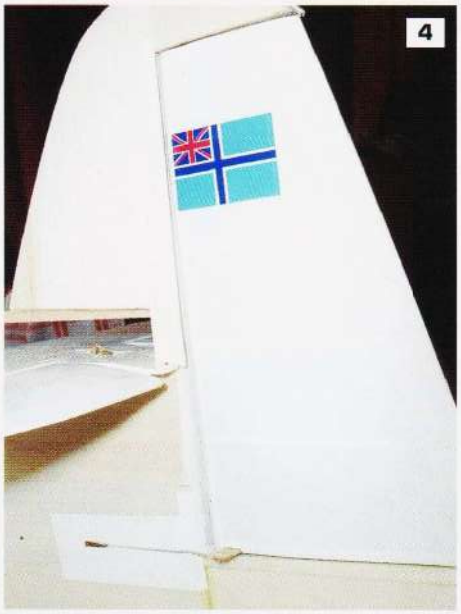
Construct a 'side sandwich' in the traditional way, cover this each side with the 1/32 in. balsa sheet as shown, and then slice carefully apart. Temporarily brace the weaker formers with scrap strip before installing. The rest is straightforward but for these few notes.

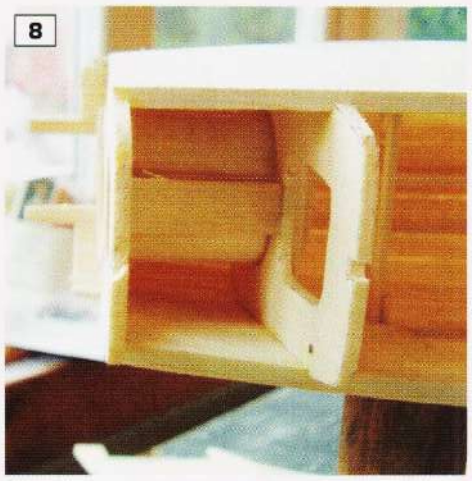
The dry assembly of the formers F2 and F3, together with the motor stick and dowel and using the motor to check, is a good idea. You can get this entire front



Decal sheet for Mew Gull G-AEXF created by the author is shown here at 50% full size.

1: Construction work commences with the two basic fuselage sides.
2: Fin and rudder are built in-situ after the tailplane is fitted and connected.
3: After assembly, the rudder is removed to permit installation of the tailplane.
4: Linkage to rudder servo is via pull-pull fishing line.
5: The central elevator horn and push-rod linkage.





end aligned and sorted. Then draw in the sides to fix to the nose former F1. As for the laminated noseblock, the drillings are to help align the assembly of this with barbecue stick (or dowel), which finally doubles as pegging through F1. This allows the entire motor with its ESC to pass through. Secure the block to F1 with a screw. The useless area of the plastic motor mount will have to be trimmed away, of course. But then you may have other power eggs in your basket!

Please don't overpower it though. My suggested set-up should be more than enough. I got the bell motor complete with its own ESC for less than £30 from BRC Hobbies UK, who also have an easily findable website. I don't know whether they have an ad here - but they should, shouldn't they? I'm using it in another model, but it is considerably more powerful than the proto's unit, though nothing like too much. Too much surgery would be involved to re-engine my model, sadly. Maybe next time!

The other areas of the fuselage structure needing care are the 1/32 in. balsa dashboard coaming and the fixing of the sternpost/fin spar. Leave the rear decking and underside unsheeted until the tailparts and controls are installed.

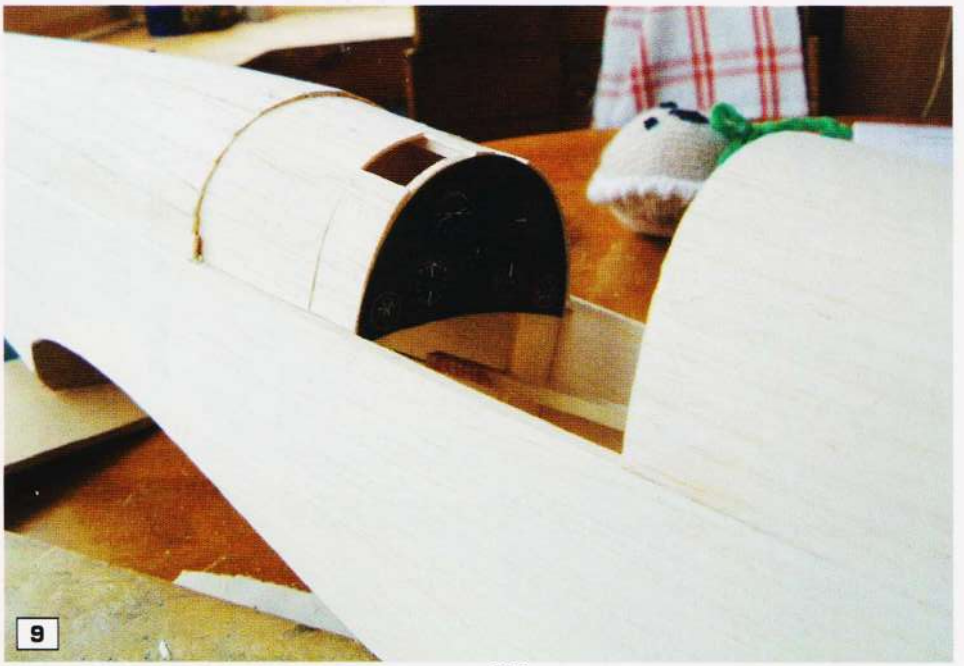
Tailplane, fin and rudder

Ever since using a pre-built hinged spar method a few years back, I've never looked back. Every model I've built, of all sizes and shapes since, has incorporated

6: The basic airframe, assembled to see how it's all coming together.

7: Who can resist trial assembly of any model as the construction progresses? It spurs you on to completion. Here, the wings and tail have been covered and the main undercarriage is in place. Rudder and elevator servos have been installed, while the fuselage awaits the top skinning.

8: Prototype model had rolled tube with hardwood insert for screw to clamp 400 motor/gearbox in place.
9: Here, the forward fuselage top deck has been planked and an instrument panel added at the cockpit.



it where possible, and my ancient grubby piece of Antique Solartex ain't never gonna run out! Although it is a little trickier to cover, the result is neat, frictionless, almost gap free and very strong. It also makes getting things centralised a doddle. Practice making up an assembly or two from scrap before applying the method to the tailplane and aileron builds.

The completed tailplane should be covered and fitted to the fuselage including its pushrod assembly. The fuselage top spine can now be fixed in, glued to the sternpost, and the fin structure commenced - building this onto the fuselage with care.

Build the rudder and sand both this and the fin to shape as if ready for covering - a little awkward with the fin being now part of the fuselage, but...

Accurately prepare the slots for your choice of hinges here, thin Mylar will be fine, the rudder has no burden such as a tailwheel etc., but it will have to endure a little 'pull' from the closed loop control. Do not attach the rudder permanently yet though. Just 'dry-fit' it with the hinges so that the rear fuselage extension can be built on and shaped to line up. Once satisfied with this, the rudder can receive its plywood horn, be covered, if desired, and set aside. I even fixed on the flag decal and the balance horn as a diversionary encouragement!

Completion of the rest of the fuselage, including the top decking (faired cleverly to the fin) can now be carried out, but leave the bottom rear skinning until the servos and closed loop rudder control have been installed.

I managed to make a pretty acceptable cockpit screen from a pop-bottle shrinking exercise.

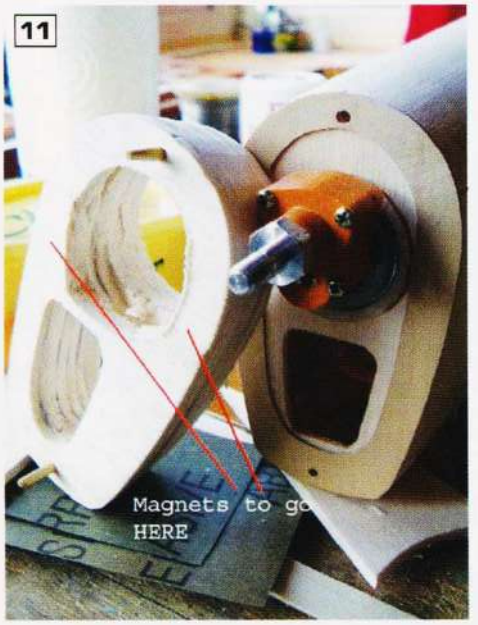
By now you will have some idea where your balance point (C of G) will end up, so the planning, surgery and additional structures necessary to install servos, battery pack and receiver should be sorted out now. A cockpit floor can be included for an 8th scale bust of a lucky pilot!

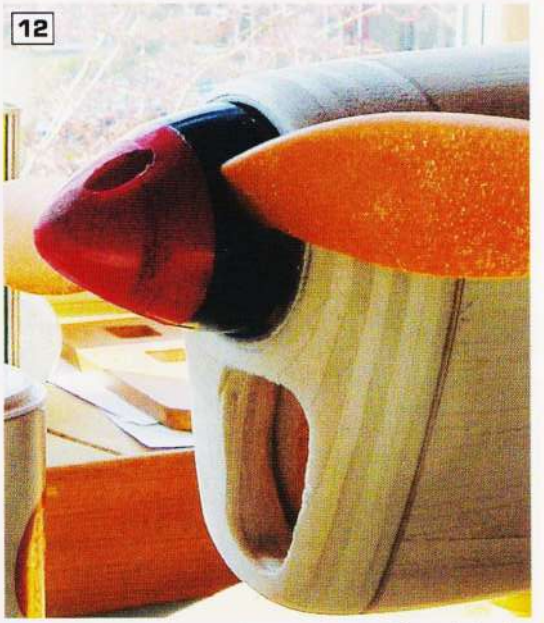
Wing

Well, whenever I cut strips (up to 3/32 in. balsa, so far) for laminating, I put them in the dishwasher! They will need to be laid along one of the top trays and loosely tied down, or you may find them wrapped accurately around some of your crocks! Then they go round anything, it seems...

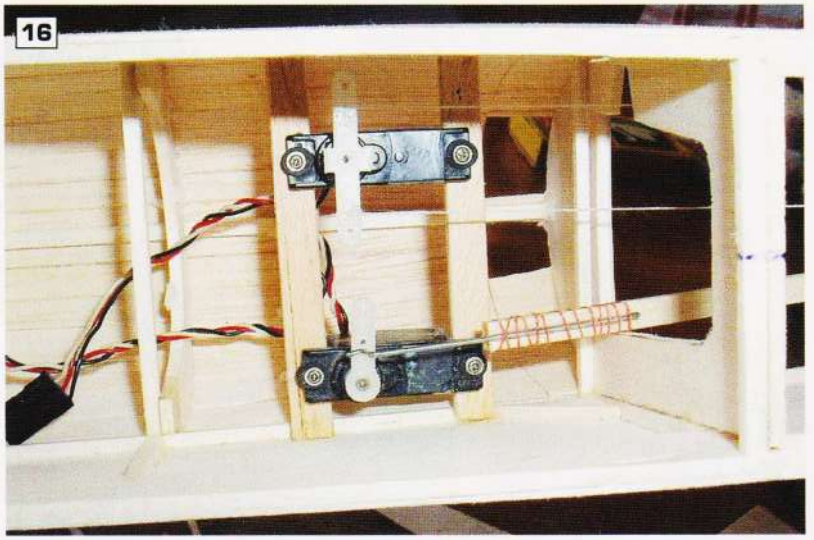
The wing-build method is clear enough (I hope!) from the plan. If you don't get the washout/dihedral right though, you'll have a model that you'd better not try and fly if there's any ground about!

The aileron operation would best be served by separate servos. A singe cen-





10 & 11: Noseblock fun..... cut the ring from salt dispenser and then put the lid back on. Salt dispenser then returned to kitchen ... without wife noticing!
12: Fully shaped nose block. 13, 14 & 15: Dummy cooling grill should be applied to both sides of fuselage. Strips of 1/16" balsa are chamfered and glued to card.



16: Detail of the rudder and elevator servo installation. Hitec HS55 type used on prototype model proved to be ideal.

tral one with bellcranks and push/pull rods would be good. The 'more-up-than-down' rule should definitely apply though.

The carbon fibre torque rod system I have used works OK and is, so far, reliable. However, I would not use it again on a model of this wingspan, now that such relatively cheap and light servos have become so easily available.

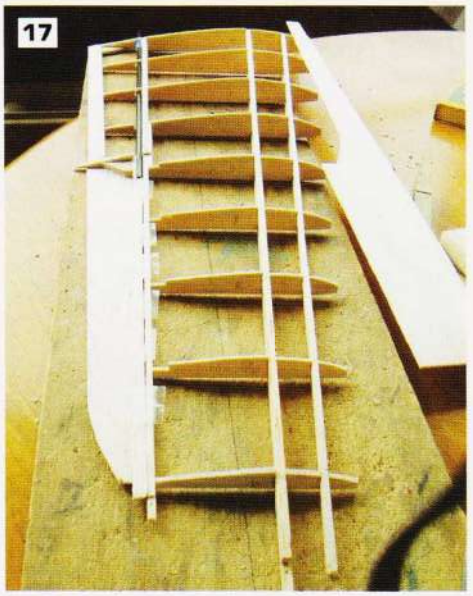
At this size, I cannot think of any improvement on the undercarriage system. It has withstood many flights so far, though nose-over landings are hard to avoid on anything but the smoothest of grass. In such cases they have only unplugged themselves, without any damage to the wing. It just lacks suspension, so landings need care.

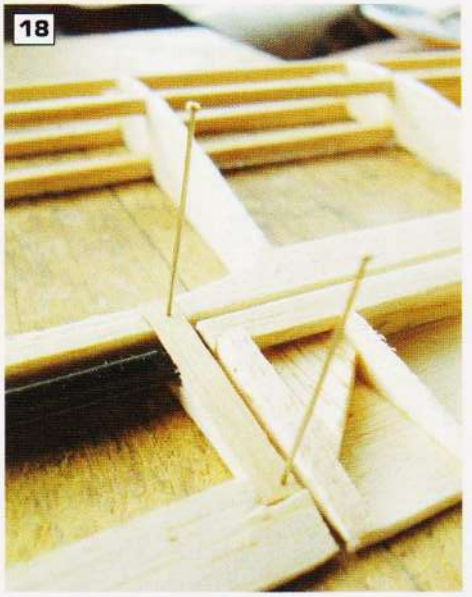
Once the wing is completely finished, it can be used to help make the root fairings. Start with gluing some 1/32 in. balsa or ply on to the lower edge of the fuselage sides at the juncture with pva. Before this sets, fix the wing in place. Isolate it with some 'klingfilm' or similar (Solarfilm backing?) and, ensuring the wood doesn't lift clear of the wing surface, allow to set. Mark off the top view profile. Add a couple of scrap fairing supports. Remove the wing, cut away the spare wood and build up the fairings with pieces of soft block (at the LE) and rolled 1/32" panels. Keep refitting the wing to check and hold things in place. A 3/32 in. fillet can be added at the trailing edge juncture and more rolled wood added. All this is trial and error work and keeping the shape going with a fine edge produces a neat result.

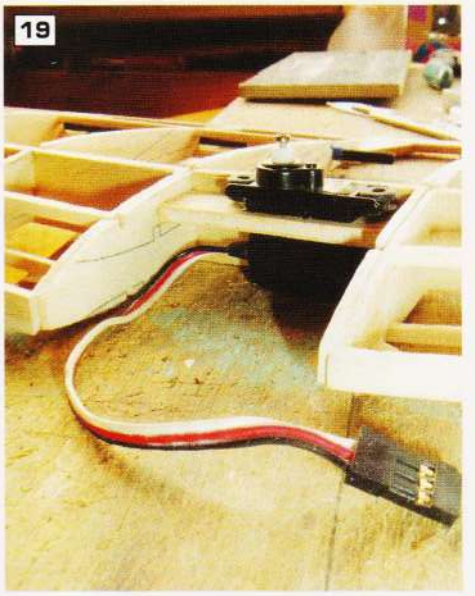
There are no unnecessary access hatches on the prototype; the wing is simply unlatched for battery fitting etc. The friction-reliant latch fixing has also proved 100% reliable. I have used it on many models of this size. On some high wingers, it has even doubled as a pseudo radio mast! Just check that it doesn't get loose now and again. I occasionally drop a bit of cyano where the screw goes, into which it 'self-taps' again.

Finally...

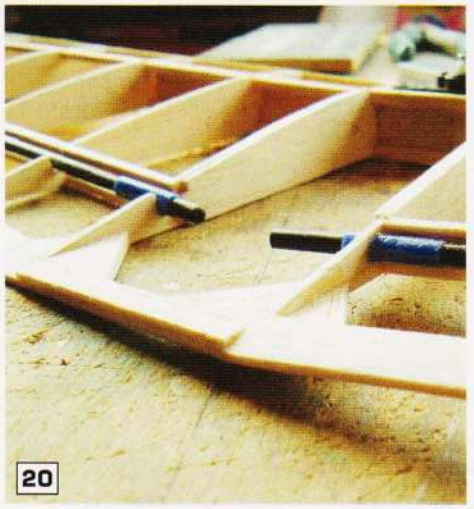
My prototype had a Ripmax geared 400 unit with an 8.4 SC NiCad pack originally. It was a lot heavier, but flew great! It's even better now with the same power, and a 1200 3S LiPo! It has a little downthrust, which causes a bit of a nose down pitch if the throttle is banged open. So there is none on this re-design.







17 - 21: Wing/aileron structural detail. The Solartex hinges are 'trapped' by the 1/16" capping. Originally, carbon fibre torque rods were used to move the ailerons but, for the sake of buying one more servo (which are now much cheaper!) - go for the update. It's better and easier! Be sure to check that they work, and set up the operation with your tranny before covering. An inaccessible servo that turns out to be a duff ain't too amusing! 22: Laminated tips made from balsa strip that's been in the dishwasher! 23: 1/32" wing sheeting applied to top only while wing panel pinned to that jig - let me know if it does the job... (You can reply to the RC Groups build thread?)



The sidethrust seems to cause a similar behaviour laterally, so this has been rejected too. Seems to confuse the aeroplane. Rather odd, really! Any allowance of a more rearward C of G proved to be near fatal, so don't try! Very tempting, though. Just please choose a take-of strip that will let the wheels roll instead!

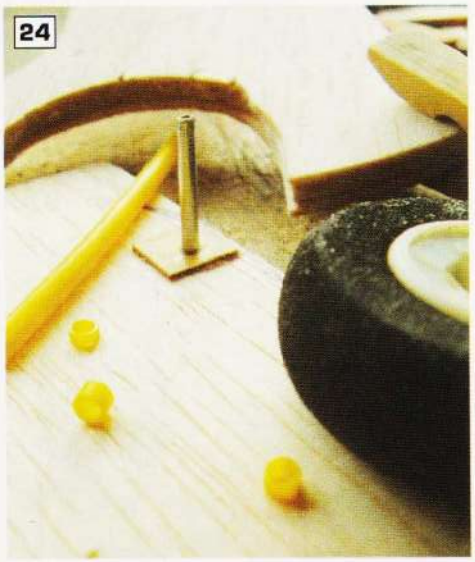
Keeping the control movements on low rate, and in these now perfect (!) weather conditions, use the gently gentle approach to throttle, up elevator releasing and rudder tracking. The Mew Gull should lift off and accelerate with just a touch of rudder correction. After that you can trim out and play for a while. Find out where the stall is kept and, remembering that like your birthday, practice a lot of approaches before using the best of one to bring the bird home. Remember about the rigid suspension!

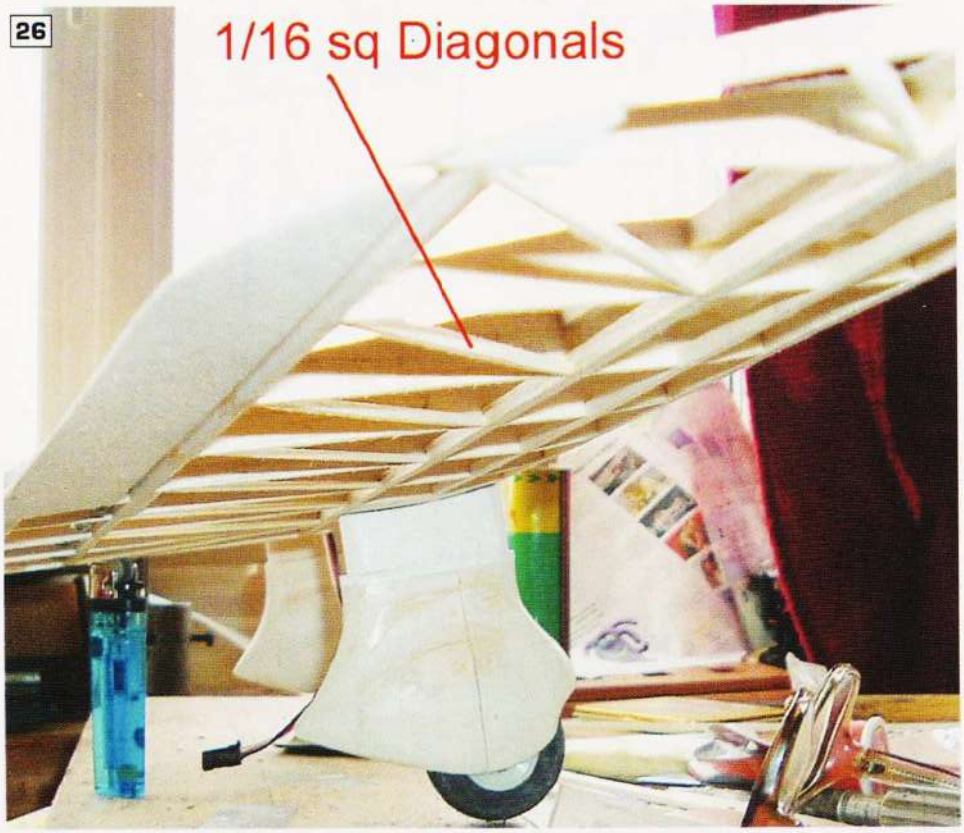
I have now put in so many design modifications here that I may well have another go at building a version for myself. The idea of the earlier, curvier, Kings Cup Mew Gulls tempt me... your editor mentioned he liked that type too. Sir Edgar Percival's own G-AFAA for one. I 'did' a model of this late last century for an O.S. 26 FS. Flew good - might still be around somewhere...

I have now set up the CNC wood parts cutting file for your plan, thereby making it possible to obtain a 'Short Kit' from FELLSIDE PRECISION CUTTING (website easily googable) so have a look at that. Some of my warbirds are there too.

Footnote.....

I had originally written *"Sir Alex Henshaw" here - believing that he had been so deservedly titled. Having watched the TV film 'The Extraordinary Mr Spitfire' (currently - September '07 - running on the History channel), this assumption was sadly corrected. Now this feature is really worth watching and contains a lot of footage of this aircraft. And, as for Alex's book - 'Flight of the Mew Gull'... Well! That's a 'Must Have'! ■





24 & 25: Making the wheel pants was a very satisfying job - should be easier now that I've drawn it up! 26: I'd reckon that the time to fit the diagonals would be when you're doing the bit in caption 23.